DOCUMENT RESUME

ED 053 403 CG 006 544

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TITLE	Effects of Sex and Birth Order on Sex Role Development and Intelligence in Kindergarten Children.
INSTITUTION	Texas Univ., Austin.
PUB DATE	Apr 71
NOTE	25p.; Speech given before Southwestern Psychological Association Annual Convention (17th, San Antonio, Tex., April 29 - May 1, 1971)
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EDRS PRICE	EDRS Price MF-$0.65 HC-$3.29
DESCRIPTORS	Children, Individual Differences, *Kindergarten Children, Role Perception, *Sex (Characteristics), *Sex Differences, Social Development, *Social Differences, *Socialization

ABSTRACT

The authors investigate MacDonald's (1969) hypothesis that a sex by birth order interaction should be observed in measures related to sex typing. Since first borns are more thoroughly socialized, MacDonald reasons, and since parental expectations differ according to the child's sex, then first born boys and girls on sex typed variables. Forty-seven male and 46 female white, middle class, kindergarten children were measured on numerous sex typing indices: (1) a modified version of Brown's It Scale; (2) Draw-A-Person; (3) Toy Preferences; (4) Game Preferences; (5) Occupational Preferences; (6) Sex Role Adoption Ratings; (7) Sociometric Play Observations; (8) Child's Perception of Parental Dominance and Power; (9) Primary Mental Abilities; and (10) Peer Preferences. Hypothesized birth order differences were not observed for measures of sex role orientation, adoption, and preferences. Significant sex by birth order actions were observed on several less crucial measures. A modification of the hypothesis is thus suggested. (TL)

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EFFECTS OF SEX AND BIRTH ORDER ON SEX ROLE DEVELOPMENT AND INTELLIGENCE IN KINDERGARTEN CHILDREN[1]

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Footnote (To Title)

[1]The authors wish to thank teachers Mary Elder, Jo Ann Williamson, and Robert Williamson for their willing cooperation and help. Appreciation is also extended to Bitsy Brumage, Carolyn Evertson, Susan Florence, Dr. Dwain Hearn, Sylvia Hearn, Peter Jennings, Doug Kleiber, and Kellyn Rozier for their assistance in data collection, data analysis, and manuscript preparation. Dr. Henry Biller's help in providing test instruments is also gratefully acknowledged.

This report is an expanded version of a paper read at the annual meeting of the Southwestern Psychological Association, San Antonio, Texas, April, 1971.

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The effort to understand birth order effects has been a continuing interest among psychological researchers. Although the data often seem confusing or contradictory, it seems clear that the sequential position of a person among his siblings does affect a number of important variables. Among those studied have been eminence, intelligence, and affiliative behavior (Schachter, 1963; Gerard and Rabbie, 1961), conformity-dependence (Sears, 1950; Schachter, 1964; MacDonald, 1969), identification (Stotland and Dunn, 1963), delinquency (Rosenow and Whyte, 1931), incidence of alcoholism (Schachter, 1963) and schizophrenia (Schooler, 1961). Sells and Roff (1967) counted over seventy studies between 1950 and 1967 dealing with birth order in whole or in part. Despite this research activity, however, the direction, magnitude, and implications of birth order effects remain poorly understood. In large part, this has been because birth order research often has yielded conflicting results (Warren, 1966). Also, the effects of important demographic variables, such as sex and age, often have been either confounded or ignored in the birth order investigations. For example, Schachter's findings relating birth order and anxiety-affiliation (Schachter, 1959) have been discussed as if they were general data applying to both sexes, although the data were taken from an exclusively female sample (MacDonald, 1969).

Failure to take into account sex of subjects seems to be one of the major reasons for the conflicting data in birth order research. To date, it appears that differences found between first- and later-born females do not obtain or are reversed in males (Gerard and Rabbie, 1961; Zucker, Manosevitz and Lanyon, 1968; MacDonald, 1969; Laosa and Brophy, 1970).

A recent hypothesis offered by MacDonald (1969) appears to reconcile some of these disparate findings. This hypothesis postulates that some birth order differences may be due largely to the operation of differential levels of socialization by birth order. It begins with the assumption that first borns are more thoroughly socialized than later borns, tending to conform more closely to parental standards. Since parental expectations differ according to the child's sex, however, a sex by birth order interaction should occur when first borns and later borns are compared on variables related to sex typing. First born boys and girls should differ from one another to a greater degree than later born boys and girls on sex typed variables. MacDonald (1969) has shown that this hypothesis integrates some of the disparate findings in birth order research and serves well as a post-facto explanation for them.

Most birth order data can be used to evaluate this hypothesis only indirectly, however, since it comes from college-aged subjects being studied long after the hypothesized effects have occurred. The hypothesis can be studied more directly with young children who are presently in the process of sex typing. This type of study was done recently by the present authors (Laosa and Brophy, 1970), using a sample of urban, middle-class kindergarten children. The data generally supported MacDonald's hypothesis, since all significant sex by birth order interactions and most non-significant trends were consistent with it. Measures included sex typed preferences in occupational choices, games choices, and peer choices; Primary Mental Abilities patterns; and play behavior. Significant sex by birth order interactions were obtained for job choices (first born boys preferring the

most masculine jobs, and first born girls the most feminine jobs) and for measures of time spent in solitary play. First born boys played alone more often than later born boys, but this birth order trend was reversed among the girls. Interpretation of this finding stressed the possible relationship between it and Schachter's data on anxiety-affiliation (first born females tended to prefer the company of others in anxiety producing situations, while later borns preferred to be alone).

The Laosa and Brophy (1970) data were based on a small sample and represented new findings that could not be easily related to other available data. Consequently, this work was replicated and extended in the present research.

Method

Subjects

Kindergarten-aged children were again chosen for study, since this age is particularly appropriate to assess sex role development. Some aspects of sex role are not as well developed or as easily measurable with younger children, and at the same time kindergarten children are still young enough so that familial influences remain strong relative to peer influences.

The S's in the present study were 47 male and 46 female kindergarten children from white, English speaking families. Their ages ranged from 60 to 83 months, with a mean of 69.9 months. Fathers' occupational levels ranged from technical and white collar workers to business managers and college professors. The median educational level for fathers was some college education, without a college degree. In general, the sample can

be characterized as middle class urban children from stable families who represent the dominant values of American culture. There were 15 first born or only boys, 32 later born boys, 17 first born or only girls, and 29 later born girls.

Measures

Several measures of sex typing were included in the study. Lynn (1959) distinguished among sex role preference, sex role adoption, and sex role identification. Sex role preference refers to the desire to adopt behavior associated with one sex or the other, or the perception of such behavior as more prefereble. Sex role adoption refers to the degree to which the individual meets the behavioral expectations assigned to his sex in his society. Sex role identification refers to the underlying incorporation of a given sex role and the unconscious responsive characteristics that accompany it. Biller (1968) has used these distinctions in developing measures of sex typing, although he has substituted the term "sex role orientation" for "sex role identification," to avoid the semantic ambiguity of the latter concept while retaining what is unique to it. Biller defines sex role orientation as the "not necessarily conscious perception of the maleness or femaleness of the self." It is assumed to be a product of a learning process taking place for the most part in the second and third years of life. Biller's terms, sex role orientation, sex role adoption, and sex role preference, along with his methods of measuring these variables were adopted for the present study.

It Scale

A modified version of Brown's (1956) It Scale (Biller, 1968) was used to assess sex role orientation. For this measure the S is shown a child's face. The face is sexually neutral, and can be perceived as either a boy or girl. S is told that the face is "a child playing a make believe game--a game where it can be anybody in the whole world--a game where this child can make believe or do anything," and is asked to associate the "child" with either the masculine or the feminine alternative from a series of pairs of choices between pictures of sex typed objects, clothes, activities, and people. It is assumed that S projects his own sex role orientation to the neutral "It" figure in choosing between male and female alternatives. Each S was scored 1 point for each masculine choice made, yielding a scale ranging from 0 to 11.

Draw-A-Person

Each S was asked to "draw a person" on a blank 8½" by 11" sheet of paper. Following the general assumption that S's initial figure drawing is a reflection of his underlying self-conception, and that drawing one's own sex first reflects a sexually appropriate self concept (Biller, 1968), the sex of the first figure drawn was recorded and used as one measure of sex role orientation. When the first figure was completed, S was questioned to establish the figure's sex. He then was asked to draw a person of the opposite sex on the other side of the paper.

The drawings were later scored for sex differentiation. Failure to differentiate between the two drawings can be taken as an indication of a vague or uncertain sex role orientation (Biller, 1968). Differentiation of

sex was scored as present or absent by two independent judges. Judges agreed on all but one case, which was resolved by discussion.

Toy Preferences

Sex typing in toy preferences is one frequently used measure of sex role preference. Two toy preference measures were used in this research. The first was a forced choice measure (Biller, 1968) in which each S was presented with 10 pairs of drawings of toys, one of each pair appropriate for masculine play and one for feminine play, and was asked to select his own preference in each pair. S was scored one point for each masculine choice, yielding a scale from 0 to 10 points.

To complement Biller's forced choice measure, a second toy choice measure was used which allowed S to select freely from an array of choices. The array included nine pictures of toys clipped from catalogues and glued to a piece of black construction paper. The choices included three masculine toys (tool set, fire truck, and service station set) three feminine toys (doll, dishes, and stove) and three neutral toys (viewmaster, phonograph, and puzzle). S was asked "If you could play with any one of these toys right now, which one would you like to play with?" This was repeated until S had made five selections. A single score was derived by counting 2 points for each masculine choice, 1 point for each neutral choice, and 0 points for each feminine choice, yielding a scale ranging from 2 (feminine extreme) to 8 points (masculine extreme).

Game Preference

Sex typing in game preferences was also assessed with a forced choice measure taken from Biller (1968). Each S was presented with ten pairs of drawings showing children engaged in games. There were separate sets for boys and for girls, with the male set showing boys playing the games and the female set showing girls playing the same games. One picture in each pair was appropriate for males and one for females (football vs. jumprope, hopscotch vs. archery, dancing vs. basketball, baseball vs. jacks, blocks vs. house, jumprope vs. baseball, jacks vs. football, blocks vs. dancing, hopscotch vs. basketball, archery vs. house). S was asked to look at each pair of drawings and indicate which game he would like to play the most. S was scored 1 point for each masculine choice, yielding a scale from 0 to 10 points.

Occupational Preferences

A measure of sex typing in occupational preferences was obtained by asking each S to name three occupations he would enjoy filling when he grew up. Two independent judges then rated these job choices according to the degree to which the jobs were associated with one sex role or the other, using a 5-point scale (1=exclusively feminine, 2=primarily feminine, 3=neutral, 4=primarily masculine, 5=exclusively masculine). Judges agreed on 67% of the ratings with 94% within one scale point. A single score was obtained for each child by adding the ratings of the two judges on each of his three choices, yielding a scale from 6 points (feminine extreme) to 30 points (masculine extreme).

Sex Role Adoption Ratings

Sex role adoption measures were obtained through teacher ratings of the degree to which the children showed sex typed behaviors, using scales developed by Biller from an earlier instrument (Biller, 1968). Teachers rated the children on each of 20 concretely described behaviors, using a 5-point scale(very frequently,frequently,sometimes,seldom,very seldom). Ten of the behaviors are typically assoicated with boys, while the other ten are typically associated with girls. These ratings yielded three measures: a sum for the 10 male items, a sum for the 10 female items, and a difference score reflecting the degree to which the child's behavior (as perceived by the teacher) favored one sex role at the expense of the other.

Sociometric Play Observations

Sociometric play observations were made by the teachers during a period of free play. The teacher observed and recorded the composition of the groups of children which had formed spontaneously. An average of twenty observations were made in each class, equally balanced between indoor and outdoor play periods. Each sociometric record shows the different play groups that were operating independently at the time. The names of children in the same group are grouped together, and the names of children who were playing alone at the time are recorded separately. A spot check of reliability for these observations showed 93 percent agreement between two observers.

The observation data were tabulated and converted to percentages (to control for absences) expressing the amount of time each S spent in groups varying in size (playing alone vs. playing in a pair vs. playing in a group of three or more) and sex composition (boys only, girls only, or mixed group).

Parental Dominance and Power

There is evidence suggesting that sex typing measures are affected by the child's perception of parental dominance and power in family interactions (Biller, 1968), and that parental power relations are accurately reflected in children's direct reports (Schaefer, 1965). In the present study, children's perceptions of parental dominance were measured through a questionnaire interview instrument adapted by Biller (1968) from earlier work by Freedheim (1960). This instrument involves rather direct questioning about parental dominance in the areas of decision making, competence, nurturance, and limit setting. Examples of items in each of these areas were, respectively, "Who says which TV program your family watches?" "If one of your toys is broken, who fixes it?" "Who gives you the most spending money?" and "Who tells you what time to go to bed?"

Freedheim's (1960) method was followed in scoring the children's choices. When S designated the father or father surrogate as the dominant individual, 4 points were scored. When he designated the mother or mother surrogate as the dominant individual, no points were scored. If he initially answered by saying "both" or "don't know," a more specific statement was requested ("Who does it the most?"). If S then said father or father

surrogate, 3 points were scored, and if he then said mother or mother surrogate, 1 point was scored. If he persisted in answering "both" or was vague, 2 points were scored. Uncles, grandfathers, older brothers, or other males were considered father surrogates, and parallel females were considered mother surrogates.

In addition to the scale items, the question "Who in your family is the smartest?" was added as a measure of parental saliency. This item was scored similarly to the items on the scale.

Primary Mental Abilities

Thurstone's (1963) Primary Mental Abilities Test (PMA), form K-1, was administered to the children by their respective teachers, using the group administration procedure given in the test manual. This form of the test yields scores for four sub-scales (verbal ability, perceptual speed, numerical ability, and spatial ability) as well as a score for the total test. All five of these scores were converted to IQ equivalents (using Thurstone's tables) for purposes of analysis.

Peer Preferences

Sex typing in peer preferences was assessed as an additional measure of sex role preferences. Snapshots were taken of each kindergarten class on a day when all the children were present. These snapshots were later used to get a measure of peer choice by asking S to look at the picture and name his five favorite playmates in the class. One point was scored for each male chosen, yielding a scale ranging from 0 through 5 points.

These same data also were used to generate popularity measures, by computing the number of times each S was chosen as a desired playmate by boys in his class (popularity with boys) and by girls in his class (popularity with girls).

Procedure

Except for the data collected by the teachers, the measures were administered during individual sessions with each child. These were conducted in a game-like atmosphere by five trained experimenters (E) working during regular school hours, but using a separate room free from distraction. Two male and three female Es were used. Each E spent several hours at the school getting acquainted with the children to develop easy rapport before beginning data collection. Each class was told that E was interested in children and had some games to play and some questions to ask. Several Es were used so that individual and sex differences in Es could be taken into account.

Results

Before testing for sex by birth order interactions, the data that had been collected by the five Es were analyzed for experimenter effects. Analyses of variance revealed no significant main effects or interactions involving individual differences or sex differences in Es. Consequently, E effects were dropped from further consideration, and all measures were subjected to two-way analyses of variance with sex and birth order (first and only children vs. later born) as fixed independent variables.

The group means and p-values concerning sex and birth order effects for the measures of sex typing are presented in Table 1.

Insert Table 1 about here

As expected, significant sex differences appeared on all of these measures (this doesn't show up in the p-values for the two DAP measures because of the way these data were scored, but it is clear that the children tended to draw their own sex first and differentiate drawings by sex). Birth order effects and interactions, however, were mostly not significant. The table has been designed so that the group means would descend linearly from left to right whenever the predicted sex by birth order interaction occurred (again, except for the two DAP measures). Inspection of the table in this light shows that the predicted pattern did not appear on any of the sex typing measures. Two sex by birth order interactions approached statistical significance, but neither of these represents the predicted relationships among the groups. The game preference data show the later born boys to be more highly sex typed, and the difference favoring the first born and only boys on the DAP sex differentiation measure is ambiguous in view of their weaker preference for drawing their own sex first on the DAP. Thus the sex by birth order interaction hypothesis is not confirmed in any of the direct sex typing measures.

Data from the other measures are presented in Table 2.

Insert Table 2 about here

Several significant main effects for sex appear in these data as expected, mostly in the play data and the sociometric popularity scores. The children tended to choose members of their own sex as playmates, both in the interview measure and in their observed play behavior. The data on playing alone vs. in pairs vs. in larger groups replicate previous findings (Laosa and Brophy, 1970) almost exactly. Girls tended to play in pairs more than boys, and a significant sex by birth order interaction was observed in the data on solitary play.

In the data on perceptions of parental dominance, children of both sexes tended to agree in seeing fathers as dominant in decision making and competence and mothers as dominant in limit setting. A significant main effect for sex occurred on the perceptions of parental nurturance. Girls tended to see their mothers as more nurturant than their fathers, while boys saw their parents as more nearly equal in this trait. No other significant main effects or interactions appear on the four parental dominance scales.

For replies to the question "Who in your family is the smartest?" the main effect for sex and the sex by birth order interaction were significant at the .035 and .051 levels, respectively. First born boys saw their fathers or father surrogates as the smartest. Later born boys and later born girls tended to agree, but less extremely. First born girls, however, scored exactly at the mid-point. As a group, they did not favor either parent as being smarter than the other.

The PMA data show a significant main effect for sex and a significant sex by birth order interaction for the perceptual speed sub-test. Consistent

with previous findings (Laosa and Brophy, 1970), first born boys had the lowest scores on this measure and first born girls the highest. There was no trend for first born boys to score high and first born girls low on the spatial sub-test, however. This trend had been observed in the previous study.

Interpretation of the PMA data is difficult because the first born boys scored generally lower than the other groups (apparently due to sampling error).

Discussion

The data from the direct measures of sex typing consistently negate predictions from MacDonald's hypothesis, because the expected birth order effects were not observed. Since the present study did not control for the sex of the subjects' siblings, it is possible that sibling effects masked parental socialization effects that might have been observed (Koch, 1956; Sutton-Smith and Rosenberg, 1970). However, the lack of even suggestive non-significant trends in the data of Table 1 make this unlikely. The simplest conclusion is that the findings on the direct measures of sex typing clearly negate the sex by birth order interaction hypothesis as stated by MacDonald.

However, significant interactions were observed in the data on solitary play, on the perceptual speed subtest of the PMA, and on the responses to question about who is smartest in the family. Furthermore, the first two of these findings were observed in the earlier study (Laosa and Brophy, 1970). This suggests that the sex by birth order interaction hypothesis is tenable

for some measures but not others, and that it needs to be stated more specifically and somewhat differently than MacDonald has suggested.

MacDonald's formulation rests on two assumptions: first borns are more thoroughly socialized than later borns, and parental expectations differ according to the child's sex. Both of these assumptions appear to be true. However, they apparently don't interact in any simple, linear way. The birth order difference appears not to apply, or not be strong enough to make any difference, in many measures, especially direct sex typing measures. This is consistent with the theorizing of Kohlberg (Kohlberg, 1966; Kohlberg and Zigler, 1968) who maintains that sex typing is mediated largely through cognitive development (especially understanding of sex role expectations), rather than through identification with the same-sex parent or direct reinforcement of sex typed behavior. Kohlberg's cognitive-developmental view would predict no birth order differences on direct measures of sex typing.

The data for the "Who is the smartest?" question could be interpreted as an exception to this trend, since this item can be seen as a measure of identification with the same-sex parent. However, a similar sex by birth order interaction did not appear consistently on the four parental dominance scales, and confidence in the interaction finding on the "Who is the smartest?" question would require replication.

As in the previous study (Laosa and Brophy, 1970), interpretability of the solitary play data in terms of MacDonald's hypothesis is weakened by the lack of a significant sex effect. MacDonald (1969) modified Schachter's (1959) original interpretation, which assumed greater dependency in first

borns, by hypothesizing that this birth order effect would interact with the sex difference in the socialization of dependency. Applying this to the solitary play data, a perfect fit would require that first-born males have the highest scores, and first born females the lowest scores, with the other two groups in between. In both this and the previous study, however, later born girls showed more solitary play than either male group. Thus the finding of the sex by birth order interaction on this measure is replicated, but interpretation based on hypotheses about the socialization of dependency is questionable. Satisfactory interpretation of the solitary play data will probably require behavioral observations indicating exactly what the children are doing during solitary play episodes. Hopefully, these analyses would reveal the psychological meaning of this behavior and suggest something in addition to the socialization of dependency which might link it to both sex typing and birth order.

If the sex by birth order interaction hypothesis does not hold up for all variables related to sex typing, where does it apply, and why? On the negative side, it seems clear that the hypothesis does not apply to the more direct and overt sex role measures. The problem is lack of consistent birth order differences, and is interpretable within Kohlberg's cognitive-developmental hypotheses. On the positive side, we might expect sex by birth order interactions to appear when variables are only indirectly related to sex typing. Certain covert variables (attitudes, motives, cognitive and expressive styles) and overt behaviors (independence, dependence, solitary play) do show consistent sex differences, even though they are not rigidly sex typed. Within these kinds of variables, those which are most

heavily shaped by interaction with parents (as opposed to peers or general acculturation) would seem to be the ones most likely to show birth order effects, so that a sex by birth order interaction would result. In addition to those mentioned, variables such as locus of control (Rotter, 1966) and the various aspects of field articulation (Witkin, 1969) would seem to be likely candidates.

Table 1. Sex and Birth Order Effects in Sex Typing Measures

Measures	Group Means: First Born and Only Boys	Later Born Boys	Later Born Girls	First Born and Only Girls	p-Values*: Sex	Birth Order	Interaction
Sex Role Orientation:							
"It" scale	8.67	7.94	3.21	5.00	.000	NS	NS
DAP: Own sex first	67%	78%	75%	76%	NS	NS	NS
DAP: Sex differentiation	100%	78%	93%	88%	NS	NS	.06
Sex Role Preference:							
Toys (forced choice)	9.07	9.75	1.46	0.65	.000	.036	NS
Toys (free choice)	6.93	7.56	2.96	2.76	.000	NS	NS
Games	6.47	8.31	1.93	1.70	.000	.017	.058
Occupations	28.33	28.25	11.48	12.29	.000	NS	NS
Peers	4.14	4.68	0.63	0.60	.000	NS	NS
Sex Role Adoption:							
Sum for male items	27.60	27.84	19.90	19.35	.000	NS	NS
Sum for female items	22.60	21.94	28.83	27.24	.000	NS	NS
Male sum-female sum	5.00	5.91	-8.72	-7.88	.000	NS	NS

*p-values are from two-way analyses of variance (sex x birth order)

Table 2. Sex and Birth Order Effects in Other Measures

Measures	Group Means				p-Values*		
	First Born and Only Boys	Later Born Boys	Later Born Girls	First Born and Only Girls	Sex	Birth Order	Interaction
Play Data:							
% plays alone	9.50	3.75	9.65	6.33	NS	NS	.040
% plays with boys only	47.50	58.17	7.62	6.80	.000	NS	NS
% plays with girls only	4.21	4.08	68.50	64.40	.000	NS	NS
% plays in mixed group	48.21	38.00	23.96	28.86	.000	.013	NS
% plays with one other	6.07	9.21	18.35	19.00	.000	NS	NS
% plays with two or more	84.43	87.08	72.23	74.80	.000	NS	NS
Popularity:							
With boys	4.71	4.40	0.31	0.73	.000	NS	NS
With girls	0.64	0.64	4.31	4.13	.000	NS	NS
Perceptions of Parental Dominance:							
Decision-making	15.00	14.64	14.54	14.38	NS	NS	NS
Competence	17.93	17.55	16.68	17.94	NS	NS	NS
Nurturance	12.53	11.84	8.39	11.00	.022	NS	NS
Limit setting	5.47	7.16	6.11	5.75	NS	NS	NS
"Who is smartest?"	3.47	3.10	3.04	2.00	.035	NS	.051

Table 2. (Continued)

Measures	Group Means				p-Values*		
	First Born and Only Boys	Later Born Boys	Later Born Girls	First Born and Only Girls	Sex	Birth Order	Interaction
PMA IQ Equivalents:							
Verbal	109.27	111.93	110.28	110.44	NS	NS	NS
Perceptual speed	97.20	109.10	111.04	115.50	.009	NS	.033
Numerical	101.13	111.60	114.11	108.56	NS	.013	NS
Spatial	103.73	110.07	107.86	109.12	NS	NS	NS
Total	102.80	110.03	110.11	110.00	NS	NS	NS

*p-values are from two-way analyses of variance (sex x birth order)

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